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The College Forest: Nursery

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The College Forest Nursery

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PART I

Purpose of the Nursery

In two large respects does the forest tree nursery at Iowa State College fulfill its existence, namely, (1) it offers favorable conditions for supplementing the undergraduate's as well as the graduate student's class work with practice, and (2) it is a source for planting stock to carry out experimental and practical work of the extension service for restocking woodlots, establishing erosion projects, erecting shelterbelts and windbreaks and for reforestation work.

The nursery is under the competent direction of Prof. J. A. Larsen, who is also the instructor of the course in nursery practice which is required of all students. In this course, actual nursery work for two afternoons per week is supplemented by two recitation periods. The students carry out operations in every phase of tree growing, from the preparation of the seedbed to the shipment of the stock.

Besides the work done by the students taking the course in planting, there are opportunities for students to earn compensation for work in the nursery during the rush season. Charles Cozad, a practical nursery man, is in charge of the field work.

The original nursery of four acres is located north of the R. O. T. C. armory. Due to the rapid expansion of the nursery, and also because of the Artillery unit using the adjacent field for army maneuverings which stirs up considerable dust harmful to the young trees, an additional area of 10 acres was established southwest of the campus.

An annual inventory is made each fall to determine the amount of stock available for distribution the following spring. At present, there are 38 species of hardwoods and conifers growing, of which black locust and black walnut constitute by far the largest percentage of all species.

The forestry department exercises great care in the distribution of stock, all of which is used for experimental and demonstrational purposes as provided for in the Clark-McNary Act. The stock is used for woodlot planting, erosion control and general reforestation work, of which windbreaks and shelterbelts are the principal uses. An organized and directed demonstration planting is carried on in each township, so far as stock is available, under the supervision of the extension service. The trees are distributed at cost of raising, packing and shipping.

The applicant for stock enters into an agreement to use the trees for such designated purposes only. He must agree to fence

the windbreak or shelterbelt planting with good woven wire fence. The area must be protected from fire, and livestock must be kept out. Proper care and cultivation of the trees must be maintained. Finally, the applicant must agree to make reasonable reports in regard to the condition of the plantation upon request of the extension service, and to permit inspection at any time.

PART II

Nursery Practice

The establishment and development of young trees is the main purpose of the school nursery, therefore the remainder of this article will be devoted to a brief discussion of the proper methods of establishing a nursery.

As near ideal conditions as possible should be sought in the choice of a nursery site. A light, rich, well-drained soil offers the best conditions for rapid growth and the assurance of a dense and healthy crop. In Iowa it is necessary to have some means for supplying water to young trees during the hot, dry summers. The college nursery has an overhead sprinkling system for that purpose. Considerable care must be exercised in sprinkling the young seedlings on a hot day, since a sudden application of cold water is very harmful.

The choice of species to be planted is determined mainly by the purpose for which the trees are to be used. For example, black locust, *Robinia pseudoacacia,* is the best tree for erosion plantings, and Norway spruce, *Picea excelsa,* and white pine, *Pinus strobus,* are well suited for windbreaks and shelterbelts.

The seeds used by the college nursery are usually bought from local seed houses, although such common seeds as white elm and white oak are gathered from trees on the campus.

Before sowing the seeds, germination tests are made. Germination tests are made by the application of one of two general methods, (1) by direct contact with the soil, such as placing the seeds in a flower pot, or, (2) by media other than soil. In the first method, a light, sterile, well-drained soil which will prevent the accumulation of fungi is the best soil to use. The most satisfactory and uniform results are secured by this test because it is a natural method. In the second method, more attention must be given the seeds as they must not be allowed to dry out. Blotters, strips of flannel cloth, plates of porous clay or plaster of paris are used as moisture-giving media in making these tests.

A determination of clean seed percentage is also made. An estimate of the number of seeds per pound is made by counting a few hundred seeds and carefully weighing them, and, by proportion, determining the approximate number of seeds per pound.

All these tests are necessary in order to utilize the maximum amount of seedbed space and to obtain the desired distribution of the seedlings.

The preparation of the seedbeds is the first step toward the establishment of a crop of seedlings. For conifers this is best done in the spring of the year. The seedbeds are laid out in multiples of four by twelve (4 x 12) feet and are surrounded by four-inch boards set halfway into the ground. The soil in the seedbed should be well spaded and pulverized.

To prevent damping-off, which is a general term applied to the destruction of young seedlings by a parasitic fungus, one of several methods is used to combat this possible injury. A weak solution of sulphuric acid, a zinc chloride and copper sulphate solution, or a formalin solution is used. The latter is the one considered most effective and is used by the school nursery. It consists of one part of commercial formalin to 100 to 200 parts of water, and is applied at the rate of 1½ gallons per square foot of seedbed several days before seeding.

Finally, the surface is once more evened off, and a light application of sand is spread over the bed, followed by the sowing of seeds either in a broadcast manner or in drills. The seeds are then covered with a layer of light soil and sand. The beds are tagged to designate the species planted. A covering of burlap is placed over the surface to prevent drying out of the soil and to increase root development.

An 18-inch frame of chicken-wire meshing is placed around the beds to keep out the rodents. When the burlap is removed after germination, a covering of laths is placed over the tops of the frames to protect the young seedlings from the direct rays of the sun.

For most hardwood species, such great care is unnecessary as the seedlings are less susceptible to damping-off, and, in general, are more hardy. A bed four feet wide and of any convenient length is prepared for these hardy species in a manner similar to that of a garden bed. Seeds such as elm and black locust are sown broadcast and raked under, and without further treatment except weeding and watering, develop well.

In the spring of the second year, the coniferous seedlings are transplanted before setting out in their final growing place. Transplanting is done for two main reasons, (1) to thin the seedlings so as to encourage root and crown development, and (2) to provide seedbed space for another crop. Hardwood seedlings are seldom transplanted, since most of them are large enough at the end of the first year to permit direct planting in a permanent location.

Transplanting should be done in the early spring after the soil has loosened up and become warm. There are various ways

of transplanting and various kinds of equipment used. The college nursery uses the Yale transplant board. This apparatus simply consists of a board six feet long and six inches wide, with 37 notches for holding as many seedlings. The roots extend from the lower edge of the board, while the seedlings are held in place by another smaller board clamped to the frame.

The coniferous seedlings are set in long rows 18 inches apart. The transplant board is placed on a level with the ground with the roots hanging down ready to be covered by the soil. The dirt is tamped firmly around the seedlings, and the outer board removed, releasing the plants. This is a very simple yet fast and effective means for transplanting.

Cultivation is necessary at frequent intervals throughout the year in order to aerate the soil and to destroy weeds. The seedlings must be watered when necessary. The coniferous seedlings thus remain from one to two years in the transplant beds.

The shipping of stock is done in the spring when planting operations usually take place. While the plants are in transit from the field to the packing house, they are continuously protected from drying out by keeping the roots covered either with dirt or wet sphagnum moss.

During shipment, extreme care must be given the seedlings to prevent drying out of the roots. This is accomplished by packing the roots in sphagnum moss (which retains moisture well and does not decompose) or straw. The seedlings are then wrapped in paper, usually reinforced with a cloth back or cord. The bundles are securely bound, a tag attached and are ready for shipment.

They say best men are molded out of faults;
And, for the most, become much more the better
For being a little bad.